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10/541,011	12/20/2005	Ashutosh Joshi	0-05-106	9060

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EXAMINER	
WONG, EDNA	

ART UNIT	PAPER NUMBER
1753	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/541,011	JOSHI ET AL.	
	Examiner	Art Unit	
	Edna Wong	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :June 28, 2005 and February 8, 2006.

Specification

The disclosure is objected to because of the following informalities:

page 1, line 17, "10^9 $M^{-1}sec^{-1}$" should be amended to -- 10^9 $M^{-1}sec^{-1}$ --.

page 7, line 22, the word "acidand" should be amended to the words -- acid and --.

Appropriate correction is required.

Claim Objections

Claim **7** is objected to because of the following informalities:

Claim 7

line 2, it is suggested that the word "to" be amended to the word -- at --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims **1-18** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1

line 4, "said mixture" (singular) lacks antecedent basis. See also claim 1, line 7; and claim 9, line 2.

Claim 6

line 2, it appears that the limitation of "has wavelength of from 190 to 390 nm" is further limiting the ultraviolet light recited in claim 1, line 7. However, it is unclear if it is. If it is, then it is suggested that the "radiation" in claim 6, line 1, be amended to the word -- light --.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims **1-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over **CS 274995** ('995) in combination with **Parrish** (US Patent No. 6,793,903 B1).

CS '995 teaches a method for enhancing the generation of hydroxyl radicals (OH*) in aqueous mixtures (= wastewaters or aqueous solutions) containing hydrogen peroxide (= H_2O_2), comprising:

(i) supplying oxygen to said mixture (= bubbling air or O_2 through the solution);

(ii) supplying Fe^{+2}, Cu^{2+} or Ni^{+2} to said mixture as a catalyst;

(iii) irradiating said mixture with UV light (= under UV irradiation); and

(iv) mixing said mixture (= from bubbling air or O_2 through the solution) [abstract].

The aqueous mixture is an aqueous solution or suspension (= wastewaters or aqueous solutions) [abstract].

The oxygen is supplied by injecting air or oxygen into the mixture (= bubbling air or O_2 through the solution) [abstract].

The UV radiation has wavelength of from 190 to 390 nm (= UV irradiation) [abstract].

The period lasts from 3 seconds to 5 hours (= 30 minutes) [abstract].

The period lasts from 30 second to 100 minutes (= 30 minutes) [abstract].

The method of CS '995 differs from the instant invention because CS '995 does not disclose the following:

a. Wherein the catalyst is magnesium oxide, as recited in claim 1.

CS '995 teaches Fe^{+2}, Cu^{2+} or Ni^{+2} as photocatalysts (abstract).

Like CS '995, Parrish teaches a method for catalytic degradation. Parrish teaches that the decomposition of hydrogen peroxide occurring on a heated surface **18** which contains a catalytic coating **20**. The catalytic coating is composed of a variety of compound including, but not limited to, *Fe(II)*, Fe(III), Cr(II), *Cu(II)*, Pt black, Ag, Pd or oxides surfaces, such as metal oxides, glass, quartz, Mo glass, Fe_3-xMN_xO_4 spinels,

Fe_2O_3 with Cu ferrite, *MgO* and Al_2O_3 (col. 3, lines 23-35).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the catalyst described by CS '995 with wherein the catalyst is magnesium oxide because hydrogen peroxide would have decomposed in the presence of heat and Fe(II), Cu(II), and MgO as taught by Parrish (col. 3, lines 23-35). Thus, substituting the Fe^{+2} and Cu^{2+} disclosed by CS '995 with MgO would have been functionally equivalent as taught by Parrish (col. 3, lines 23-35). And it has been held that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination (MPEP § 2144.06 and § 2144.07).

b. Wherein the hydrogen peroxide has an initial concentration of from 2 to 250 ppm, as recited in claim 3.

CS '995 teaches that H_2O_2 is used as an initiator in a concentration corresponding to 10% of the molar concentration of the complexing agents (abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hydrogen peroxide described by CS '995 with wherein the hydrogen peroxide has an initial concentration of from 2 to 250 ppm because the initial hydrogen peroxide concentration is a result-effective variable and one skilled in the art has the skill to calculate the initial hydrogen peroxide concentration that would have determined the success of the desired reaction to occur, e.g., decomposing/oxidizing the complexing agents in the wastewaters or aqueous solutions

(MPEP § 2141.03 and § 2144.05(II)(B)).

Furthermore, the initial hydrogen peroxide concentration would have determined the concentration of the oxidative free radicals formed.

Furthermore, Parrish teaches that high concentrations (over 50%) of hydrogen peroxide in solution are unstable and the rate of decomposition increases by a factor of 2.3 for each 10° C temperature rise (col. 3, line 65 to col. 4, line 9).

Furthermore, it has been held that changes in temperature, concentration or both, is not a patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art, such ranges are termed "critical" ranges and Applicant has the burden of proving such criticality; even though Applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within capabilities of one skilled in the art; more particularly, where general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Aller*, 220 F2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and MPEP § 2144.05.

c. Wherein the oxygen is supplied to saturation, as recited in claim 5.

The oxygen disclosed by CS '995 is inherently supplied in an amount.

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to have modified the oxygen described by CS '995 with wherein the oxygen is supplied to saturation because the oxygen supplied is a result-effective variable and one skilled in the art has the skill to calculate the oxygen supplied that would have determined the success of the desired reaction to occur, e.g., decomposing/oxidizing the complexing agents in the wastewaters or aqueous solutions (MPEP § 2141.03 and § 2144.05(II)(B)).

Furthermore, it has been held that changes in temperature, concentration or both, is not a patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art, such ranges are termed "critical" ranges and Applicant has the burden of proving such criticality; even though Applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within capabilities of one skilled in the art; more particularly, where general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Aller*, 220 F2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and MPEP § 2144.05.

d. Wherein the magnesium oxide is added to the mixture to a concentration of from 2 ppm to 250 ppm, as recited in claim 7.

The magnesium oxide disclosed by Parrish would have inherently been added to

the mixture at a concentration.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the magnesium oxide described by CS '995 and Parrish with wherein the magnesium oxide is added to the mixture to a concentration of from 2 ppm to 250 ppm because the magnesium oxide concentration is a result-effective variable and one skilled in the art has the skill to calculate the magnesium oxide concentration that would have determined the success of the desired reaction to occur, e.g., decomposing/oxidizing the complexing agents in the wastewaters or aqueous solutions (MPEP § 2141.03 and § 2144.05(II)(B)).

Furthermore, it has been held that changes in temperature, concentration or both, is not a patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art, such ranges are termed "critical" ranges and Applicant has the burden of proving such criticality; even though Applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within capabilities of one skilled in the art; more particularly, where general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Aller*, 220 F2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and MPEP § 2144.05.

e. Wherein the initial concentration of hydrogen peroxide is from 10 to 50 ppm, and the initial concentration of magnesium oxide is from 10 to 50 ppm, as recited in claim 8.

CS '995 teaches that H_2O_2 is used as an initiator in a concentration corresponding to 10% of the molar concentration of the complexing agents (abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hydrogen peroxide described by CS '995 with wherein the initial concentration of hydrogen peroxide is from 10 to 50 ppm because the initial hydrogen peroxide concentration is a result-effective variable and one skilled in the art has the skill to calculate the initial hydrogen peroxide concentration that would have determined the success of the desired reaction to occur, e.g., decomposing/oxidizing the complexing agents in the wastewaters or aqueous solutions (MPEP § 2141.03 and § 2144.05(II)(B)).

Furthermore, the initial hydrogen peroxide concentration would have determined the concentration of the oxidative free radicals formed.

Furthermore, Parrish teaches that high concentrations (over 50%) of hydrogen peroxide in solution are unstable and the rate of decomposition increases by a factor of 2.3 for each 10° C temperature rise (col. 3, line 65 to col. 4, line 9).

The magnesium oxide disclosed by Parrish would have inherently been added to the mixture at a concentration.

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to have modified the magnesium oxide described by CS '995 and Parrish with wherein the initial concentration of magnesium oxide is from 10 to 50 ppm because the initial magnesium oxide concentration is a result-effective variable and one skilled in the art has the skill to calculate the initial magnesium oxide concentration that would have determined the success of the desired reaction to occur, e.g., decomposing/oxidizing the complexing agents in the wastewaters or aqueous solutions (MPEP § 2141.03 and § 2144.05(II)(B)).

Furthermore, it has been held that changes in temperature, concentration or both, is not a patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art, such ranges are termed "critical" ranges and Applicant has the burden of proving such criticality; even though Applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within capabilities of one skilled in the art; more particularly, where general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Aller*, 220 F2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and MPEP § 2144.05.

f. Wherein the pH of said mixture has a value of from 5 to 10, as recited in claim 9.

g. Wherein said pH has a value of 7.2 to 9.7, as recited in claim 10.

The mixture disclosed by CS '995 inherently has a pH.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the mixture described by CS '995 with wherein the pH of said mixture has a value of from 5 to 10; and wherein said pH has a value of 7.2 to 9.7 because it has been held that changes in temperature, *concentration* or both, is not a patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art, such ranges are termed "critical" ranges and Applicant has the burden of proving such criticality; even though Applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within capabilities of one skilled in the art; more particularly, where general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Aller*, 220 F2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and MPEP § 2144.05.

h. Wherein said mixing is carried out for a period of time sufficient to generate the desired amount of radicals, as recited in claim 11.

CS '995 teaches bubbling air or O_2 through the solution (abstract). The bubbling is carried out for a period of time. CS '995 teaches within 30 minutes (abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the mixing described by CS '995 with wherein said mixing is carried out for a period of time sufficient to generate the desired amount of radicals because the Applicant has a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

i. Wherein said desired amount of radicals is an amount sufficient to reach a required biocidal effect in the mixture, as recited in claim 12.

The method for photochemical degradation disclosed by CS '995 inherently has an amount of radicals in an amount sufficient for oxidation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the amount of radicals described by CS '995 with wherein said desired amount of radicals is an amount sufficient to reach a required biocidal effect in the mixture because the Applicant has a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190

USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

j. Wherein said period lasts more than 5 hours, as recited in claim 15.

CS '995 teaches bubbling air or O_2 through the solution (abstract). The bubbling is carried out for a period of time. CS '995 teaches within 30 minutes (abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the period described by CS '995 with wherein said period lasts more than 5 hours because the period is a result-effective variable and one skilled in the art has the skill to calculate the period that would have determined the success of the desired reaction to occur (MPEP § 2141.03 and § 2144.05(II)(B).

k. Wherein said desired amount of radicals is a predetermined quantity, as recited in claim 16.

The method for photochemical degradation disclosed by CS '995 inherently has an amount of radicals in an amount sufficient for oxidation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the amount of radicals described by CS '995 with wherein said desired amount of radicals is a predetermined quantity because no

difference is seen between using a predetermined quantity and a non-predetermined quantity, as long as the quantity is used.

I. Wherein generated radicals are quantified by a physical or chemical method, as recited in claim 17.

The method for photochemical degradation disclosed by CS '995 inherently has an amount of radicals in an amount sufficient for oxidation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the generated radicals described by CS '995 with wherein generated radicals are quantified by a physical or chemical method because where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation (MPEP § 2144.05).

One having ordinary skill would have known of quantitative analysis.

II. Claim **18** is rejected under 35 U.S.C. 103(a) as being unpatentable over **CS 274995** ('995) in combination with **Parrish** (US Patent No. 6,793,903 B1) as applied to claims 1-17 above, and further in view of **DD 51638** ('638).

CS '995 and Parrish are as applied above and incorporated herein.

The method of CS '995 differs from the instant invention because CS '995 does not disclose wherein said chemical method comprises reacting the hydroxyl radicals

with salicylic acid, as recited in claim 18.

CS '995 teaches decomposing complexing agents in wastewaters or aqueous solution. The complexing agents are disodium EDTA, Na N,N-diethyldithiocarbamate, Na benzoate, *phenol* and *oxalic acid* (abstract).

Like CS '995, DD '638 teaches the oxidation of organic compounds. A complexing agent, such as *phenols*, hydroxyanthraquinones, *salicylic acid*, sulfosalicyclic acid, citric acid, *oxalic acid*, etc., is added to the reaction mixture (abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the complexing agents described by CS '995 with wherein said chemical method comprises reacting the hydroxyl radicals with salicylic acid because this would have depended upon the type of wastewaters or aqueous solutions treated. Salicylic acid is a conventional complexing agent in aqueous solutions as evidence by DD '638 (abstract).

Furthermore, a generic disclosure (= complexing agents) renders a claimed species (= salicylic acid) *prima facie* obvious. *Ex parte George* 21 USPQ 2d 1057, 1060 (BPAI 1991); *In re Woodruff* 16 USPQ 2d 1934; *Merck & Co. v. Biocraft Lab. Inc.* 10 USPQ 2d 1843 (Fed. Cir. 1983); *In re Susi* 169 USPQ 423 (CCPA 1971).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-

1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Edna Wong
Primary Examiner
Art Unit 1753

EW
November 15, 2006